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ABSTRACT

During the last decade, there has been growing interest and research in environmental assessment. One environment that has received special attention is the university environment. Since environments are seen to relate to a person's growth and development, it follows that environments that maximize the match between students' needs, goals, and aspirations and university resources enhance student life and lessen dysfunctional stress. Environmental design, then, is an appropriate target for mental health professionals. One factor that has inhibited the environmental design process is the absence of a practical theory. This paper offers a 10-step environmental assessment model that is built on the natural processes students actually use as they map their environment. Included in the paper are examples of some instruments that may help the environmental design process. (Author)

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The cover depicts man's striving toward unity of personality, represented by the magic circle, or mandala.

ECO-MAPPING: A DYNAMIC MODEL FOR INTENTIONAL CAMPUS DESIGN

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Abstract

During the last decade, there has been growing interest and research in environmental assessment. One environment that has received special attention is the university environment. Since environments are seen to relate to a person's growth and development, it follows that environments that maximize the match between students' needs, goals and aspirations and university resources enhance student life and lessen dysfunctional stress. Environmental design, then, is an appropriate target for mental health professionals. One factor that has inhibited the environmental design process is the absence of a practical theory. This paper offers a ten-step environmental assessment model that is built on the natural processes students actually use as they map their environment. Included in the paper are examples of some instruments that may help the environmental design process.

ECO-MAPPING: A DYNAMIC MODEL FOR INTENTIONAL CAMPUS DESIGN

Toward a Model of Environmental Design: Some preliminary Notions

Introduction

During the past decade there has been a significant increase in research concerning person-environment interaction (Mitchell 1969; Craik, 1973; Walsh, 1973; Insel & Moos, 1974; Moose, 1974; Wicker, 1972). Environments have been conceptualized as having unique personalities. Some are supportive, trusting and open while others are controlling, suspicious and closed. The climate and structure of the environment are related to the inhabitants' satisfaction, mood, self-esteem and personal growth (Insel & Moos, 1974). Furthermore, the interaction between personality characteristics and environmental characteristics has a great impact on personal functioning (Insel & Moos, 1974; Moos, 1974c; Endler & Hunt, 1968; Pace and Stern, 1958) and the development of intellectual powers and personality patterns (Holland, 1963b; Pervin, 1968; Claunch, 1964; Lott & Lott, 1965; Walsh, 1973). With the realization and acknowledgement of the impact environmental conditions have on human functioning, there has been an increased interest among mental health professionals in intervening in the environment both to repair or remediate destructive systems and to redesign environments so that dysfunction can be prevented and intellectual, social, physical, and emotional growth facilitated (Cowen & Zax, 1968; Banning, 1973; Morrill & Hurst, 1971; WICHE, 1973).

Assessing Campus Environments

Among many possible person-environment relationships to be studied, the university environment/student interaction has received special attention. Quoting a WICHE (Western Interstate Commission for Higher Education) task force report (Quality of Educational Life: Priorities for Today), Kaiser (1973) notes that there are innumerable mismatches between the campus environment and organization and the needs and desires of students. It was suggested

that a methodology to assess the matches and mismatches between students and campus environments receive high priority among mental health activities. Such assessment should lead to an ability on the part of the campus mental health workers to alleviate situations of debilitating stress and to engage in intentional campus design. With a better match between students and the environment, student stress can be ameliorated and growth and development promoted.

One factor which blocks the implementation of plans for promoting a more congruent environment is the relative newness of the art of environmental assessment or eco-mapping. In attempting to assess the environment and the person-environment relationship, the researcher is confronted with an unwieldy task. Not only is the environment amorphous, but there are innumerable variables that input into the total system. This suggests that a systematic and comprehensive study might be unfeasible, if not impossible.

Researchers or theorists, themselves, have added to the complexity of environmental assessment. Those interested in assessing the environment and person-environment relationships have used a variety of constructs for this assessment making a comparison of findings difficult. Assessment methodologies have fallen along several continua, i.e. from the objective to the subjective or from a focus on the effects of environments to the transactions between persons and the environment. Thus, while some systems have been more objective, focusing on the geographies, physical attributes or the behaviors in the environment (Barker, 1968; Craik, 1971; Sommer, 1969) other systems have used a more phenomenological approach (Pace, 1969; Pervin, 1967; Peterson, 1968). These latter systems have depended more on the inhabitants' subjective perceptions of the environment. Other systems, meanwhile, have focused primarily on demographic characteristics of inhabitants and institutional characteristics (Astin, 1968; Holland, 1966).

Compounding this diversity, little attention has been paid to any integration of these various models. As a result, there has been meager opportunity for the researcher to profit from investigations other than those congruent with the approach she/he has opted for. The purpose of this paper is to present a model of environmental assessment which attempts to integrate objective and phenomenological trends in environmental mapping and which allows for the assessment of person-environment interaction and its outcome for both the person and the environment.

Towards an Integration

While past environmental assessment techniques have taken one approach (e.g., subjective perceptions, behaviors, etc.), the dynamic assessment model assumes that the university environment is more complex. It is a function of many different components. The purpose of the proposed model is to identify components of an environment and their interrelationships, in order to produce a comprehensive picture of that environment.

In addition, environmental assessment strategies have been dependent on a unique theoretical assumption (e.g., Holland, 1966b; Pervin, 1968; Stern, 1970) by which the environment was defined; the proposed approach assumed that an environment, like a person, is multi-faceted and that it can only be understood when seemingly different or divergent approaches are unified. If researchers wish to understand environments more fully, they are encouraged to study phenomenological, physical, and behavioral descriptions of an environment instead of being restricted to one point of view. As researchers utilize the multi-method notion of environmental assessment more and more, the differences between systems should lessen. This will obviate the present data gap that exists between systems and allow for cross pollination.

The proposed model is built on a number of assumptions: (1) the source of much individual dysfunction is systemic and thus intervention in the system itself is a legitimate mental health function; (2) as individuals engage a system they develop a cognitive map of the environment and make subjective judgements about their fit in the environment; (3) a comprehensive picture of the environment can be developed by an ecological design expert by systematically and comprehensively building on these natural mapping processes. Although the model presented here has as its focus the assessment and redesign of a university environment, it can be extended for use in other environments.

This paper will present a model for environmental assessment and redesign. The first step will be to offer a conceptualization of mapping or what Kaiser (1973) calls eco-mapping. Part Two will be a presentation of the ten step model. Included with the presentation will be examples and implications of the mapping process.

Student Mapping

As the first point of departure, the meaning of "map" needs to be considered. Map can be considered in two distinct ways: (1) as a noun it speaks of content; (2) as a verb, it speaks of action. In making the application of map to environmental assessment, it can be said that mapping means: (1) the identification of the contents of a system, i.e., its topography; and (2) routing, which can be said to be the process of engaging the system. To map then, in the first sense, would be to lay out the topography of the campus, for example, identifying various student services and facilities, their existence and relative locations. Mapping in the second sense is the process students engage in as they route their way to various areas such as Engineering, Academic Advising, or Financial Aid.

When students enter new environments, many tasks confront them. In addition to certain strengths and abilities, they bring specific needs and goals

to the environment. An immediate task for students as they engage the environment is to locate which might satisfy those needs and goals. For instance, as students first begin the process of engaging a new university environment, they want to know where they will live. In response to this, some will procure a map to locate their residence hall; others will ask to be directed to their residence hall by more experienced friends or university personnel; and others will wander about the campus until they find their new home. This individualized mapping process will be repeated over and over again in more or less efficient ways as needs arise and resources are sought.

Effects of this process are twofold: (1) since people have different mapping skills, some will be more effective than others; and (2) as the mapping process unfolds, students will be confronted with environmental matches (they will locate the resources they need, and students will be confronted with environmental mismatches (they won't be able to locate the resources they need). In the latter case, environmental mismatches often precipitate stress and anxiety for the student. Mapping then has two central components: (1) a person identifies or assesses the topography, which includes both the content and the climate of the system, and (2) a person routes, that is, engages, the environment and identifies matches and mismatches between needs and resources.

Identifying the Topography. One of the student's first tasks in engaging the new university environment is to find his or her residence hall in order to move in belongings and say goodbye to parents and friends. To do this, she or he will have to know there is a residence hall, where it is, and how to get there. Students will also have perceptions and expectations of what the new environment is like as they proceed with this process. For example, the environment can look quite positive when one or two people volunteer to assist in unloading a car or U-haul trailer. These several processes taken together

are called "mapping the topography." Topography, then, embraces the content of the system and the system's climate.

As students work through the system a large number of them will need services such as academic advising, financial aid, housing, etc. On many campuses these services have been institutionalized and publicized. If a student should experience some difficulty or stress in the environment, there may be a service that can help. For example, as Joe has more and more difficulty in his Math class he might seek tutoring or change from the sciences; as Sally has more difficulty meeting the financial burden of her textbooks and lab fees, she might seek assistance from a financial aid office. In any given experience of stress, a student's task is to map (1) the presence, (2) the location, and (3) the route to a resource that will abate the stress. As the student locates various aspects of the topography, the information becomes part of the student's map of the campus topography. It should be noted that the examples offered are by no means meant to be exhaustive. Other examples of system content include: the fine arts series office, an office for women's programs, or an honors program.

Finally, in the student's day after day interactions with other students, faculty, and staff, he or she will begin thinking about, describing or talking about what it is like to be at this campus. Perception of the campus climate will often reflect a number of the matches/mismatches the student has confronted. A match occurs when the student is able to meet her or his needs with environmental resources; that is, the student and environment are in a state of congruence. In those instances when the environment does not provide the resources necessary for a specific student need, a mismatch or state of incongruence is said to occur. For example, if a student enters a university seeking an intellectual climate and is confronted with a social one, a mismatch is said to occur. If, on the other hand, a student desires to be

autonomous and independent, and enters a climate that fosters these variables, then a match is said to have occurred.

Routing. In the mapping process, another area of consideration (in addition to identifying the topography) is routing. While topography speaks to both content and climate, it doesn't speak to how people actually find resources or what they do if they do or do not find them. This is the domain of routing. As people engage the environment, they exhibit certain routing behaviors. As with mapping skills in general, routing skills differ across individuals; some people are more systematic and effective than others at routing themselves through the environment. Students are also more or less satisfied/frustrated. If an environmental designer's goal is to heighten the congruence between the student and the university environment, then the behaviors of students who experience stress or a greater number of environmental mismatches are of particular note.

Some students are able to make their way through the environment at will. There are those individuals who not only know what is available, but where it is. They readily get what they need. Other students can spend four years and not gain access to critical resources the environment provides. The process by which individuals seek out environmental resources and the concomitant behaviors are important variables if one is to understand the university environment fully. This concept as it applies to the model will be discussed later in this paper.

While the student who was experiencing environmental matches may study appropriately and go out to meet people, the frustrated student may drop out of school, take drugs or get sick. Coping behaviors, such as the above, vary in number or intensity according to the degree of stress and frustration an individual experiences. They are an important way to diagnose the climate and recommend environmental changes.

A Model for Environmental Assessment and Redesign

An Overview

In the introduction, we presented an outline of the way we conceptualize students' functioning in the university environment. In the next phase of this paper we will deal with a model for environmental assessment and redesign that is based upon (and built from) our thinking about student mapping. In this model the mental health professional who wishes to assess and intervene in the environment must go through a number of the same steps engaged in by any inhabitant of an environment. That is, the environment is assessed and its content, climate, and typical behaviors are identified (a process called charting the topography). After the assessment of the needs and goals (and any other relevant personal characteristics) of individuals and subgroups, the environmental design consultant identifies apparent matches and mismatches between a need or goal and what is provided by the environment. If an apparent mismatch is identified, the next step involves the validation of the mismatch. Does a mismatch actually exist? This necessitates another search of the environment. If the mismatch is only apparent, then routing is called for. That is, if there really are resources in the environment that would meet the students' unmet needs, the solution entails merely putting the student or student groups in touch with those resources. It could be that a student thinks he or she is unable to stay at a university because of financial difficulties. Possible opportunities for making a match in this instance would be helping the student to contact the Financial Aid office, student employment, or a government loan project. If there are not facilities on campus to meet the student's or group's need, then the mismatch is real. There are three alternatives for change that follow from this: (1) counsel the individual out of the environment; (2) create a match by changing student needs; (3) create

a match by changing the environment; or (4) in a preventative way, make a major shift in admissions policy directed toward preventing future mismatches.

The counterpart to the above is the identification of apparent matches. An apparent match occurs when a match between sets of goals and needs is believed to exist. While step one identifies apparent matches, step two is a validation process; that is, it answers whether the match, in fact, exists or is only illusory. The validation process demands a search of the environment identifying the system contents to substantiate the existence of the match and an assessment of whether any route to the match might be impeded because of a road block, a detour or a dead end. If the validation process revealed that the match was in fact only apparent (or that it was a pseudo match), then a mismatch exists (--); the alternatives to a mismatch noted above hold in this instance. If the match is real but blocked (+-), then attention is directed toward uncovering the nature of the block. If the apparent match is real and is working (++), then a match in fact exists.

The PEC as Process Consultant

In many respects the person responsible for this environmental assessment and redesign, the Environmental Design Consultant (EDC), performs many functions similar to Schein's (1969) process consultant. The process consultant (PC) and EDC are similar in that both can be called social therapists (Schein, 1969). They work to make settings better places to be in; their scope does differ, however. The process consultant is somewhat problem-centered; that is, the PC's task is to find problem areas in an organization. The EDC, on the other hand, is more preventive in nature in that his or her general function is to design environments which are more conducive to growth and development (Skinner, 1975).

Both consultants are concerned with human processes. Organizational functioning or environmental climates reflect human interaction variables. "The process consultant is primarily an expert on processes at the individual, interpersonal and intergroup levels (Schein, 1969, P. 9)." In order to chart the environment, the EDC must be an expert PC. Instead of focusing solely on human interaction variables, however, the EDC includes and makes explicit rather than implicit the effects of physical setting, geography, and service availability for individuals within a certain setting.

Finally, the PC and the EDC must be aware of and use this consultative strategy to maximize their intervention. If the consultant is to be effective as an intervention agent, he or she needs to be sensitive to the client/consultant relationship lest the work effort be frustrated, or in some instances, sabotaged.

A Model for Assessment and Redesign

The preceding sections of this paper have dealt with the concept of environmental assessment and redesign as a reflection of natural but complex human processes and as a mode of process consultation. The model to be presented now is designed to take the reader from the initial entry into the system to the establishment of a permanent feedback loop relaying the effects of system changes on system functioning.

Unlike the previously referenced models or designs for environmental assessment, the present model is not limited to viewing person-environment interaction from a single, and thus necessarily narrow, point of view. Rather, the intent is to integrate various methods of assessment (questionnaire, interview, observation, etc.) and various contents of the assessment (perceptions, behaviors, events, demographics, physical features) to yield a comprehensive and more detailed picture of the environment. The assessment and

redesign model has been conceptualized as a ten-step process outlined below.

I. Obtain Sanction and Establish an On-Site Design Team.

II. Chart the Topography.

A. Actual

B. Perceived

III. Assess Needs and Goals.

IV. Identify Apparent Matches and Mismatches.

V. Validation.

VI. Identify Behaviors Used to Cope With Apparent and Real Matches.

VII. Feedback Information to On-Site Design Team.

VIII. Evaluate Where Changes Need to and Can be Made.

IX. Plan and Implement Programs and Environmental Interventions.

X. Assess the Intervention and Continue Feedback.

The remainder of this section will be devoted to presenting and discussing these ten steps, their significance and interrelationships.

Step I: Obtain Sanction and Establish an On-Site Design Team. An environmental design consultant (EDC) is called in to map the university when administrators, faculty, students, or all three think that the university environment or some part of it is not an optimal one. They wish both to locate the sources of discontent and change them. As a consultant, it is important that the EDC establish at least an initial relationship with the senior administrative official (or a designated representative) of the system within which the consultant is working (Caplan, 1970). This relationship must be used to gain entrance, sanction and support for all subsequent activities and to arrive at an agreement about what the task of the EDC is to be.

It is also important that the EDC make contact with constituents at other levels and from significant divisions or subgroups within the system. Out of these contacts, an ongoing on-site design team composed of representatives of the various levels and identifiable subgroups within that system (Caplan, 1970; WICHE, 1973), should emerge. It is crucial that this group and the EDC have administrative sanction within the system, and that they have the power to evaluate, prioritize and initiate subsequent intervention strategies. Without this support and sanction the work of the EDC may well be futile.

Varying amounts of the actual assessment process may be delegated to various members of this consultant group. However, the greater the extent to which they are involved in the planning and implementation of this effort, the greater the likelihood that they will profitably utilize the results (within the context of their having power to do so). In the following discussion it will be assumed for the sake of simplicity that the EDC will do most of the actual work in the assessment phases of this intervention. This is not necessarily the recommended process, however.

Step IIa: Chart the Actual Topography. Development of the chart of the topography is the first major assessment procedure. The topography is what exists in the environment, and charting the topography is the identification and description of the various features of a given system.

The first task to be accomplished in charting the topography is the isolation of those major identifying factors that distinguish this school from other schools. In other words, what are the environmental traits that exist for this university as a whole, independent of either individuals or subgroups? These traits, in many instances, are a function of school goals, history or location and are what initially attract the prospective student;

they are also expressed in the types of organizations, services, and facilities on campus. The traits of one university may be determined in large part by its presence in the big-ten football conference (i.e., it has a big stadium, extensive athletic program and facilities), another by its reputation for scholarship with emphasis on law (i.e., it has an old, ivy-covered brick building that houses an internationally reknown library), and a third for its orientation toward agriculture (i.e., the presence of extension services and a veterinary hospital).

There are two dimensions to the chart of a given topography. The first dimension may be called the "aspects of the topography." It deals with the features of the environment that are to be studied. These features include the system content, climate (as measured by instruments such as the College Survey Questionnaire), and behaviors of milieu inhabitants. The specifics of system content that are studied will vary with the nature of the system and purpose of assessment. However, in a general assessment of a university system it seems important to examine at least the physical facilities and their geographical interrelationships, the services, programs and agencies available to students, and academic offerings and procedures.

The second dimension applies to the origin of the data. This dimension includes: (1) the perceptions of milieu inhabitants, (2) what is said to exist, i.e., what is assumed to exist, and finally (3) what can be verified as existing. Each of the aspects or features of the environment in dimension one must be assessed with respect to the sources in dimension two (see Figure 1).

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(Insert Figure 1 about here)

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Methods of data collection and specific sources of data will differ for each of the cells within Figure 1. There may be some difficulty at times in

differentiating what pieces of data can be placed in the verified column and what pieces of data really belong in the "assumed to exist" category. In general, however, content, climate, and behaviors that are "assumed to exist" are what university documents and publicity materials, taken at face value, suggest is present. Some of these data can and should be gathered before the EDC ever visits the campus. This can be accomplished by requesting copies of a campus map, university catalogue, handbooks, official publications, statements of policy, organizational charts, the university charter, student government charter, lists of student services, and so on. Follow-up to this can be accomplished once the EDC is on campus by obtaining copies of regulations, university documents, student newspapers, written statements of objectives of various offices and so on.

Assessing what does exist and can be verified will necessitate different methodologies for the several aspects of the topography. Two subjects of the system content, existence of physical facilities and their geographic interrelationships, can best be assessed through a visit to the university. A careful and detailed walk through and around the campus can be used by the EDC and his or her staff to draw a multifaceted map of campus facilities, their interrelationships, and the person by whom and the frequency with which they are used, as well as of surroundings or tangential community facilities and their relationship to the campus and its occupants.

The remainder of the system content, including academic offerings and services provided for the student (e.g. residence hall progr-ms, athletic programs, financial aid, student government, counseling center) requires a more laborious effort to document. The essence of what must be done, however, begins with a search of the campus for those people responsible for various areas of student services and academic offerings. With their help, plus the

use of all available written materials (announcements, calendars, descriptions, evaluations, etc.), lists of services and academic opportunities available or offered to students in the previous year (or any other desired time period) can be generated. Student groups and leaders should also be identified and sought out to obtain information on the informal, student-to-student academic, social or athletic opportunities that are available.

In addition, the existence of various features of the topography can be verified through the results of studies, the documentation of events, statistical data, observation of interactions, physical properties, locations, accessibility, and behavior.

There would appear to be only a subtle and possible spurious distinction between the climate as it is and the climate as it is perceived. This model, however, makes that distinction. The aggregate of what each student reports about his or her own feelings, attitudes or behaviors is the climate as it is. The perceived climate is the summation of what each student perceives to be the attitudes, feelings and behaviors of the whole student body, faculty or administrators. The climate may actually be very warm and supportive because of the intertwining behaviors with climate in the above definitions; assessing the campus climate cannot be entirely separated from the assessment of behavior. For a while climate involves more than behavior, and, in fact, seems to take on an existence or form all its own; it is based ultimately on the way people act or are perceived to act, i.e., on behavior.

This paper then will not formally attempt to distinguish between the methodology for the collection of behavioral data and the methodology for the collection of climate data. Conceptually, however, it is an important feature of this model that both of these data sources are included and counted as uniquely relevant and informative in the assessment. Perhaps one way in which these two sources of knowledge can be distinguished within this methodology

is that what is called perceived climate corresponds more closely to the traditional notion of climate, while what is called actual climate is more closely allied to actual behaviors of the constituent groups on campus.

To assess the climate of a university as it verifiably exists would involve administering to a random stratified sample of student questionnaires designed to identify the attitudes, feelings and relevant behaviors (such as student-student interaction, student-faculty interaction, amounts of time spent studying, spent at athletics, etc.) of these students. Standard climate and behavioral indices aimed at the individual (such as ICA, CSQ, ECQ) might be employed or preferably, might be modified to fit the particular institution being studied, in order to give more concise and relevant data.

It may be pragmatic for the EDC to gather limited amounts of verified data at this point. This is especially true since the potential quantity of such data is almost limitless and the mismatches have not been identified. In Step V there will be need for verification of the existence of certain system content, and much of the data collection can be deferred until then.

Step IIb: Chart the Perceived Topography. Identification of the attributes of the campus or university as perceived by students is the next step in the environmental assessment. The three campus attributes contributing to the first aspect of the topography, content, can be assessed in similar ways. A group of randomly chosen students can be asked to either list those physical facilities, academic opportunities and offerings and social, interpersonal or help-related services they (1) are aware of, and/or (2) have used. They can also be asked to respond to lists of physical facilities, academic offerings and services by checking off (1) those they believe to exist on campus, and/or (2) those they have used. Employing either one or some combination of both of these techniques should give a general notion of the perceived existence of these aspects of the university topography.

Student perceptions of the university climate (including others' behavior) can be assessed through any one of a number of standard instruments (such as the CUES, IGI, CCI, CCA, CSQ, TAP) designed to measure climate factors attributed by students to the general university. Instruments that tap perceptions of overall student interests, attitudes, needs and behaviors, as well as the generic university "atmosphere" should be included here. Once again, it may be advantageous to modify these instruments to fit more tightly the particular institution under study and to focus more narrowly upon the concerns of the particular study.

The reason for advocating such instrument revision is that most published climate indices and behavioral indices are designed to obtain data that will serve to compare a given university with other universities on whom such data has already been collected. The purpose here, however, is not to compare the university under study with other either similar or different universities along some general dimensions. Rather, the purpose is to study this particular university as an individual institution, in an entirely ipsative manner. The concern is about the atmosphere of <u>this</u> university, how students behave, what they think, what they want and need and expect (or did expect when they enrolled). Evaluation then occurs in comparing and contrasting these findings both among themselves and with what the university professes to be and to supply, and with what in fact the university is and does supply. The data thus are used for intra rather than inter-university comparisons.

Because of the institution specific, time-specific and interventionist focus, events that precipitated the mapping effort will likely indicate particular areas that should be investigated in detail. In addition, preliminary investigations may lead to notions of points of incongruence between students and environment or between various constituent groups. Questions relevant to these points of concern or possible incongruence must be incorporated into

the assessment indices employed. This will call for a revision and adaptation of standard measurement instruments at the very least, and may even necessitate the construction of institution-specific indices.

At a generic level, it would seem that the chart would be the same for all individuals at an institution. However, people's experiences and perceptions vary according to the subgroups with which they are affiliated (Friedlander, 1966; Friedlander & Greenburg, 1971; Gavin, 1973; James & Hornick, 1973; Payne & Mansfield, 1973; Schneider, 1972; Schneider & Bartlett, 1970). Thus, aside from that charting procedure which considers the content of the system independent of an individual or group, there emerges another charting process which is dependent upon the subgroups which are a part of the total environment.

If a decision is made to consider the environment from the perspectives of the various population subgroups, a methodological question arises. Should the basis of assessment lie with the formal sub-units characterized, for example, living units or declared major? Or, alternatively, should the basis of assessment lie with the more informal sub-units or different cultures that naturally have come to exist within the environment? A number of studies have looked at dorms and considered them as significant influencing factors. Dressel and Lehman (1965) note that Michigan State students regard living in the dorms as one of the most impactful experiences of their college life. Other studies in a similar way have classified people according to IQ and major. Those taking the other side of this issue might consider such informal groups as ethnic origin, age (i.e., older returning students), or religious affiliation. Membership in these groups might be quite independent of other demographic variables such as place of residence and college. Fewer studies have been done using these informal types of classifications. The major difficulty seems to be in the identification of the subgroups.

The unique quality and character of the subgroups, however, demands that the three previously considered areas be reevaluated in detail relative to each subgroup, regardless of the way in which the subgroups are determined. For instance, in terms of the variables of physical layout and structure, it would be an important discovery to know that freshmen are experiencing stress in their environment because of the physical isolation caused by the location of their residence halls, which are placed at considerable distance from other living areas and classrooms. The lack of transportation to a neighboring town for those students who do not have their own transportation might be another source of stress in the environment. Thus, significant subgroups must be identified and data must be analyzed separately for each of these subgroups. Intergroup comparisons may also be useful.

Step III: Assess Needs and Goals. Both needs and goals, or one or the other, must be assessed for each identified subgroup in the system. Needs assessment seems to be the more common of the two but there is important and unique data to be gained from the assessment of goals as well. To put it succinctly, it may be that dissatisfaction in the environment is due to either disagreement over goals between significant subgroups (e.g., administrators and students) or to poor implementation of mutual goals. Intervention strategies will differ for these two situations so it becomes important to know about potential agreements or disagreements on goals among subgroups.

Because of the omnipresent fact of limited human and monetary resources, it seems advantageous to obtain a measure of the importance of identified needs or goals. Although constituents place high value (in terms of a need or goal) on many services, facilities, etc., it will be helpful to differentiate the relative significance of importance of needs/goals and thus to be able to prioritize them in a way that accurately reflects constituent

opinions. Thus, a two-pronged data gathering instrument is needed to ascertain: (1) the extent to which a need/goal should be met, and (2) the extent to which the need/goal is met.

Step IV: Identify Apparent Matches and Mismatches. Once the above data have been collected, the assessment process focuses on determining the degree of "fit" between the subgroups under study and their environment. This involves identifying not only those instances where there is a good fit between a subgroup and the environment (a match) but also points where the fit or congruence is poor (a mismatch). When assessing person-environment fit, there are two possible findings at this point: (1) there is an apparent match (the system content, climate, and constituent behavior appear to meet the needs, goals, and expectations of the subgroup and they are accessible to members of the subgroup); (2) there is an apparent mismatch (the system content, climate or constituent behaviors do not appear to meet the needs, goals, or expectations of the subgroups or they are not accessible to members of that subgroup). This is the function of Step IV. Additionally, more refined categories are introduced in Step V.

In the identification of apparent matches and mismatches, the EDC needs to ascertain the congruence or incongruence between: (1) what exists and what is perceived; (2) student needs/goals and what exists; and (3) student needs/goals and student perceptions of what exists (see Figure 2).

- - - - - - - - - - - - - - -

(Insert Figure 2 about here)

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Concretizing Figure 2 with an example from some recent research (Corazzini & Wilson, 1975; Huebner, 1975), we might find that students need strong academic advising for successful completion of their studies. Student perceptions, however, may fall into one of two categories: (1) they perceive

that they do not have a personal academic advisor, or (2) they perceive the advisor as being uninterested in them.

At this point, the EDC does not have information about the department's philosophy of advising, the system rewards for good advising, or the actual mechanism of implementing the advising system. The EDC does suppose, however, that students have advisors with whom they can meet.

Figure 2 depicts the apparent matches and mismatches that can be identified using this data. There is an apparent mismatch between the student's advising needs/goals and what students perceive is offered. There is an apparent mismatch between the students who need advising and have no advisor. There is another apparent mismatch between those students who need an advisor but perceive their advisor as not interested in them.

Moving across the figure from Perceived to Assumed Services there seems to be a potential mismatch between the students' need/goal and what is assumed to exist. Although students do have advisors, organizational policy does not provide for their availability at crucial advising times. This is a tentative and uncertain mismatch. Since the departmental philosophy is not known to the EDC, it is unknown whether there is a match or mismatch between it and the students' need/goal of making advising a significant and integral activity. There seems to be at least a partial match, however, between the perception of the students who believe that they have advisors and "assumed services." Perceived advisor disinterest cannot be evaluated with respect to what supposedly exists since there is no comparable data on faculty behavior or attitudes.

Step V: Validation. Several questions are raised when apparent matches and mismatches are identified. Chief among them is whether the apparent matches and mismatches are, in fact, actual. Validation is the procedure which answers this question. The result of the validation procedure will yield one of four alternatives: (1) the environment does truly lack that

service, facility, experience, etc. (a true mismatch); (2) the environment does not lack the service, facility, experience, etc., but it is inaccessible to constituents in general or to some particular group of people (a blocked match); (3) the service, facility, experience, etc., exists on paper only, or in name only, and is neither functional nor, consequently, accessible (a pseudo-match); (4) the service, facility, or experience that meets a felt need or goal exists and is accessible (a true match).

The process of validation is initiated when the environmental qualities involved in an apparent mismatch are compared with verified environmental qualities. Because it is uncertain what features of the environment will seem to be apparent mismatches at the beginning of the assessment, it was suggested that most of the data collection requiring validation be postponed. It is at this certain point in the assessment process that such detailed probing of the environment for the existence and accessibility of needed or valued features is undertaken. A variety of techniques are available for use in obtaining these data. Among them are the recording of events and behaviors, "walking through" the system to test out points of potential matches/mismatches, using "student confederates" to test the availability of certain services, supports or facilities, monitoring questionable points in the system and the interactions that take place there, conducting informal interviews, engaging in participant observation, and those techniques mentioned in the section of Charting the Topography which dealt with obtaining verified data.

To illustrate the process of validation, let us return to the previous example (see Figure 2) of apparent mismatches between students' goals with respect to advising, their own perceptions of the present advising system and what advising is "supposedly" like. In order to determine whether the four apparent mismatches identified are real mismatches, pseudo matches,

blocked matches, or true matches, certain questions have to be answered. Included in this set of questions are: How often do students meet with their advisors? How much time do students spend with their advisors? What are the interactions between students and advisors like? How is advising rewarded in the system? What quality control is there on advising? How do students find out who their advisor is? Are appointments kept? These questions were suggested by the nature of the students' perceptions, by the absence of factual data bout faculty and administrative values with regard to advising, and by the lack of specific factual data about student and faculty behaviors with respect to the advising process.

Although validation was not fully implemented in this instance, using the methods outlined above, the following facts might have been verified: (1) each faculty member is assigned 20 students each quarter; (2) upon entering the department, students are sent packets of information and the name of their advisor is included in this; (3) because of student mobility, many students never get this packet; in addition, the faculty member's room number is not given to the student; (4) faculty sometimes do not post office hours; (5) faculty sometimes do not keep their office hours; (6) faculty sometimes break advising appointments without contacting the student, either before or after; (7) students usually spend less than five minutes per quarter being advised; (8) faculty receive no system rewards for advising; quality of advising does not enter into raises, promotion, or tenure decisions; (9) there is no "quality control" or evaluation of advising.

These facts, taken in conjunction with student goals and perceptions, lead to the following conclusions: (1) students do have advisors and they are satisfied (a true match); (2) students may not be aware they have advisors (a blocked match); (3) advisors are not very accessible (this may be either a blocked match or a pseudo match; more detailed data would be needed

to accurately make this distinction); (4) advising is not a significant or integral part of faculty or student activity (a true mismatch).

An additional method of assessing the validity of an apparent mismatch is through the collection of "environmental referents" (WICHE, 1973) of dissatisfaction or incongruence between constituent goals and perceived reality. Environmental referents in these cases are constituents' descriptions of the events, behaviors or situations that have caused them to be dissatisfied or to perceive a discrepancy between their goals and what they have experienced. Obtaining environmental referents tells the EDC exactly what it is in the environment that is responsible for the constituents' perception of a mismatch. They provide a mechanism by which the EDC may test whether the experiences constituents have reported are due to blocked, pseudo or real mismatched, by pinpointing the referents in the constituent-environment transaction that have evoked the perceived mismatch. In addition, the notion of environmental referents may be expanded to obtain specific suggestions from constituents about what changes could (or would have to) be made to ease their dissatisfaction or decrease the degree of goal discrepancy. This same process can be used to validate apparent matches.

For example, at a western university a number of studies had suggested finances as a source of student stress and concern. Before this data could be fed back to the administrative personnel, validation of the stress was necessary. Additional information was sought about (1) precipitating environmental events, (2) coping responses by students, and (3) recommendations for change (cf. Figure 3).

In a subsequent study (Corazzini & Wilson, 1975) a random and stratified sample of 400 students were queried regarding the possibility of financial stress. Forty-seven and seven/tenths (47.7) percent responded with "strongly disagree" (1) or "disagree" (2) to the statement, "Finances are not a

significant problem for me." Before data collection, stress was defined as a response of 1 or 2 on a 5-point Likert-type scale. The 47.7% response in these categories validates the hypothesis that finances are, in fact, an identified source of difficulty for a large portion of the student population.

These students who had responses in categories 1 or 2 were asked to provide environmental referents. The data collected are organized and reported in Table 1. From a review of the table, such salient precipitating factors include: lack of financial aid, lack of parental support, fixed income for Veterans, and out-of-state tuition. A further review of the table will indicate both coping behaviors and recommendations for change.

- - - - - - - - - - - - - -

(Insert Table 1 about here)

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Step VI: Identify Behaviors Used to Cope With Apparent and Real Mismatches. This step involved the application of data collected in Step II as well as the collection (or utilization) of environmental referents, providing additional facts about student behavior in situations of incongruence. (cf. discussion and example of environmental referent as part of the validation process in Step V). Students may be asked to indicate how they have reacted (what they have done) when (1) they have felt dissatisfied, (2) they have had specific unmet needs, (3) they have indicated a discrepancy between their own goals and their perception of the degree of implementation of those goals in the environment. An effort should be made to obtain specific, concrete behavioral or affective reactions to specific situations. This allows for an evaluation of the coping behaviors as constructive or destructive and gives an indication as to the importance of ameliorating the existing situation. In addition, it may be desired to obtain more general information about an individual's responses to stressful situations, typical coping mechanisms

used, services that are made use of, and the general level of stress individuals feel. These data may be used as environmental descriptors or may be statistically related to subgroup membership, specific perceptions, and degree of incongruence experienced.

Step VII: Feedback Information to On-Site Design Team. From Step II on, the discussion has focused on explaining the theory and technology necessary to develop a comprehensive picture of the fit between the students and their environment. It was pointed out that the EDC needs consultation skills and Step I discussed the necessity of setting up an on-site team. It was pointed out also that it was crucial for the on-site team to have high level administrative sanction. The effectiveness of feeding information back into the system to effect changes will depend in large part on: (1) having put together an on-site team that is representative of the environment constituency; (2) having obtained sanction; (3) having an active and direct involvement of the on-site team in the assessment process; and (4) expecting the on-site team to be responsible for making the necessary decisions as the assessment process unfolds. The broader the base of support the EDC can build for the assessment phase, the easier the redesign phase will go. To build the essential base of support, the EDC will need to use interpersonal skills in conjunction with a sensitive awareness of political processes.

This is a very important and vital procedure in the assessment and redesign process. The nature of this procedure does depend on the extent to which the on-site design team were involved in the data gathering, analyzing, and interpreting. If there was not that collaborative relationship, it is the responsibility of the EDC to ensure that a clear and concise written report be presented to this team. This report should first of all address itself to the issues defined as relevant at the outset of the assessment process (the "presenting problem"). A secondary function might be to point out

additional areas of concern, unexpected dysfunction or incongruence. This report needs to be written in language understandable to the consumers and in a format that will facilitate positive action.

Step VIII: Evaluate Where Changes Need to and Can be Made. This step also must be carried out in concert with the on-site design team and perhaps with an even broader range of administrators and constituents. At this stage of the evaluation process, the consultant board may decide to work with the data within its own confines or it may decide to parcel out relevant pieces of the data to various offices, departments and individuals on the campus for them to take action (or not).

At this point, the goals of various groups and individuals will become of visible importance. If differing goals are resulting in general confusion and dissonance, decisions will have to be made about the willingness of the system to change some of its goals and resultant operations, to diversify goals, to live with dysfunction and dissatisfaction, or perhaps, to change and restructure its admission and hiring procedures to admit only those who would fit in and be comfortable in the existing system. The power that members of this consultant group have within the system, or the sanction and power that have been delegated for this task, will determine to a large extent the impact the research results will have overall. Likewise, the relative power of individuals within this consultant board may dictate whose goals are implemented, which group's needs are met, what changes are allowed and so forth. It is for this reason that representatives of all significant subgroups need to be seated on this board and be given equal voting power. The issues of financial, structural, time and human resource contingencies will also be evident here and will impose certain constraints on the nature, scope and content of potential interventions.

Step IX: Plan and Implement Programs and Environmental Interventions. Based on decisions made in the previous step, specific interventions can be implemented which will change the system or diversify it so that more of the needs and/or goals of the various subgroups can be met, undue stress and strain can be remediated, constructive and growth-producing behavior can be encouraged and destructive behavior made unnecessary. This is the process of intentional campus redesign.

Once the decision has been made to intervene in the environment, the mode of intervention must be determined. In some instances a greater fit can be effected simply by an administrative edict. In an example cited earlier, it was pointed out that 47.7% of a western university student body were stressed because of financial concerns. Table 1 reflects the sources of these stresses and some possible ameliorative responses. The administration could decide to hold the line on tuition increases, thereby not increasing the stress on lower out-of-state tuition. This might reduce the stress of a subgroup of students. It should be noted, however, that this may create stress in another portion of the system.

Beside administrative edict, the sources of incongruence between students and their environment can be allayed with the design and establishment of concrete programs. Referring again to the example of financial stress mentioned above and corresponding Table 1, it is apparent that one response to financial stress has been budgeting by the students. A program designed to teach survival budgeting during recession years may be a very successful strategy to lessen stress.

It might be helpful to note the program development is no easy task. It is fraught with pitfalls. Too often, ineffectual programs are continually refunded and unnecessary programs are given top priority. In an effort to maximize the efforts of reducing incongruence between students and their

environment using the program development method, it is suggested that a systematic approach to program development be used. Moore and Delworth, (1975) provide a model which insures both assessment of need and evaluation of outcome. They provide a theory and a five-stage process for program development.

It makes little difference that the redesign process has been initiated by administrative edict or program development, the important point is that there has been an attempt at heightening the fit between student needs, goals, and aspirations and environmental resources. If the intervention strategy chosen is effective a better match between students and the environment should be achieved.

Step X: Assess the Intervention and Continue Feedback. At this step the environment is reassessed, with an eye to evaluating whether or not the interventions made have increased person-environment fit and met the other intervention goals. This step then completes the assessment-intervention loop. It also builds in an ongoing systematic monitoring process that will constantly feed back the various matches/mismatches occurring for students, faculty and administrators. The changing nature of constituent needs and goals, the changing "outside world" environment, changing institutional populations and the unsystematic and sometimes unplanned institutional changes that occur, make this continued assessment vital. In addition, including a built-in evaluation process will tend to heighten the mutual adaptation process between individuals/groups and their environment, creating a climate conducive to greater satisfaction and learning.

In order to complete this step successfully and ensure the continuance of the assessment-intervention-reassessment process, the EDC must be an educator and organizer as well as an evaluator. He or she must pass on to system constituents the skills in environmental assessment and redesign or

find and organize system constituents who already possess such skills and interests. This effort may then result in the creation of a permanent and experienced in-house council (or design center, a la Kaiser, 1973) which can carry on continual evaluation, system change and feedback even after the EDC who made the original intervention has left.

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Table 1

A Summary Table of the Content for the Environmental

Referent: Finances are not a significant problem for me.

What things in the environment exist or have happened to make you feel this way?	How have you responded to this feeling or situation?	What could be done to change the environment (phsical, organizational, functional, etc.) to improve the situation?
Rising costs "difficult to pay monthly bills" (40)*	Budget - live frugally (50) "I take advantage of free things."	More money to college from State and Federal government (15)
Financial assistance is too little (47): Financial Aid Parents Scholarships Assistantships	Sought financial assistance (39)	More financial aid (40) "Look at parent's bills as well as income."
Out of State (22): "tuition is higher."	Sought scholarships (10)	Low interest loans (9)
Self-supporting (12)	Work (53)	Grants/Scholarships (29)
Married (14)	Welfare (1)	Cut dorm/tuition/book costs (44)
Few jobs (9)	Food Stamps (4)	Book co-op (3)
G.I. Bill isn't enough (4)	Don't eat well (1)	Jobs (21) "A better job finding agency."
Other (12)	Sold car (2)	More workstudy (7)
	Worry/anger (7)	Cut athletic fees (4)
	Despair (1)	Defer payment (1)
	Fear/anxiety (3)	I don't know (18)
	Quit school (8)	

*Indicates number of students who made this response.

Figure 1. Charting the Topography: An example

Sources of Data About What Exists

Aspects of the Topography	Student Perceptions	Assumed Services (described by University)	Verified
CONTENT Physical-Geographical Services Academics	*There is no office for veterans*	*There is an office for veterans*	*Not verified*
CLIMATE	*Students seem content with majors of their choice*	*Students are happy in their major due to an innovative academic advising program (source: college catalogue)*	*Verified: SM scale on CSQ is above mean for like colleges*
BEHAVIOR			

Figure 2. An example of identifying apparent matches and mismatches.

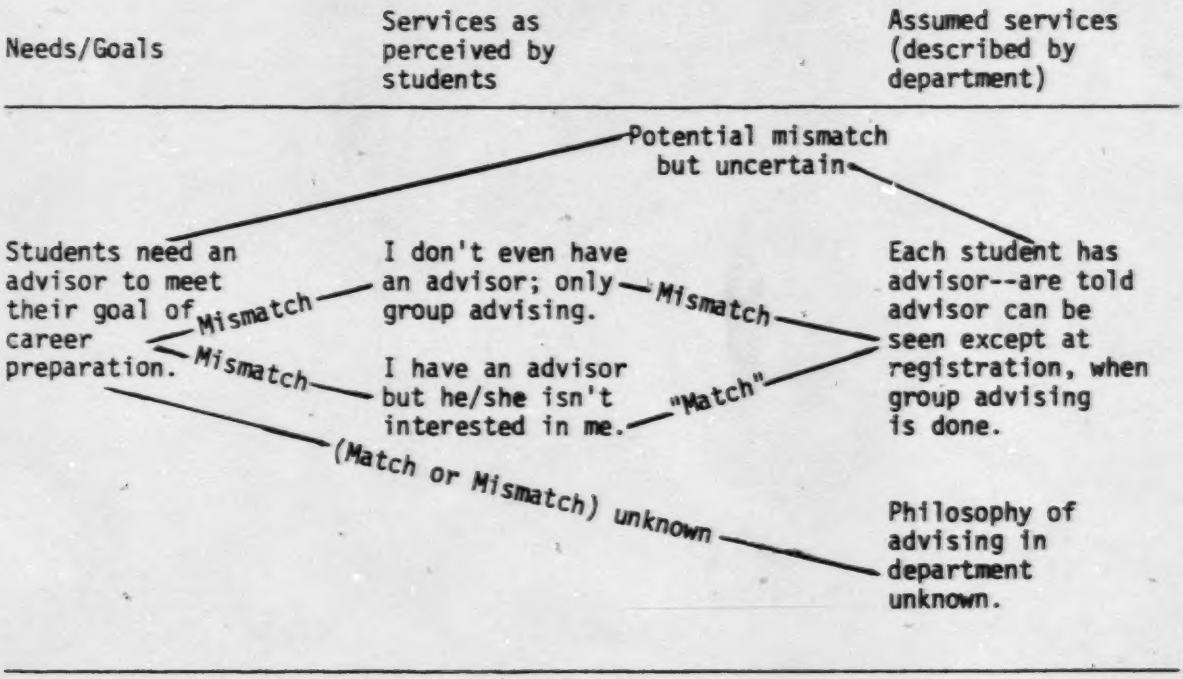
Needs/Goals
Services as perceived by students
Assumed services (described by department)
Potential mismatch but uncertain
Students need an advisor to meet their goal of career preparation.
Mismatch
Mismatch
I don't even have an advisor; only group advising.
I have an advisor but he/she isn't interested in me.
Mismatch
"Match"
Each student has advisor--are told advisor can be seen except at registration, when group advising is done.
(Match or Mismatch) unknown
Philosophy of advising in department unknown.

Figure 3. Example of an Environmental Referent

	What things in the environment exist or have happened to make you feel this way?	How have you responded to this situation or feeling?	What could be done to change the environment (physical, organizational, functional, etc.) to improve the situation?
a. I am satisfied with my living conditions (room, apartment, etc.)	*There is no decent place to study in my room, no privacy and too much noise (I live in XXX dorm).*	*I stay out of my room as much as possible--study at the library.*	*Don't require freshmen to live in dorms--make more private rooms available--have quiet hours for sleeping and studying.*

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